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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/846,042	05/01/2001	Erik J. Zimmer	M-9848 US	4500
32605	7590	12/18/2003	EXAMINER	
MACPHERSON KWOK CHEN & HEID LLP 1762 TECHNOLOGY DRIVE, SUITE 226 SAN JOSE, CA 95110			KILKENNY, TODD J	
			ART UNIT	PAPER NUMBER

1733

DATE MAILED: 12/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/846,042

Applicant(s)

ZIMMER ET AL.

Examiner

Todd J. Kilkenny

Art Unit

1733

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-18 and 20-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-18 and 20-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 May 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 9 – 14, 16 – 18, 20, 21 and 23 – 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori et al (US 6,181,667) in view of Nagano (US 6,278,681), Takei et al (US 6,125,092), Higashiura et al (US 6,184,512) and Ball et al (US 6,370,290).

Mori et al teach an optical pickup apparatus, wherein referring to Fig 12, said apparatus includes a submount (20) carrying a laser device (21) mounted onto a flexible circuit board (50) via a lead frame (32). Also mounted on said flexible circuit board (50) is an integrated circuit device (45). Mori et al fails to suggest first and second alignment marks on the submount and first and second alignment marks on the circuit board substrate. Mori et al also fails to suggest providing first and second adhesives to create fixed bonds between the submount (20), the integrated circuit device (45) and the circuit board (50), respectively (Col. 26, line 38 – Col. 27, line 39).

As to alignment marks, Nagano teaches a method of fabricating an optical head including a laser diode chip. Referring to the embodiment of Figure 10, Nagano teaches mounting a submount (4) carrying a laser diode chip (1) onto the surface of a substrate (16). Nagano further teaches that the substrate surface may be designed to

have an alignment mark or marks for accurately mounting the submount (4) (Col. 24, lines 18 – 20). Nagano appears to be silent as to providing alignment marks on the submount as well.

Takei et al. teach an optical head assembly and further disclose aligning the optical components so as achieve a high precision optical path between the laser diode and objective lens. Takei et al suggest alignment marks for aligning grating component (12) onto unit case (7), which contains optical unit (70). Referring to Figure 2, Takei et al teach providing first and second alignment marks on the grating (12) and first and second alignment marks on the top surface of the casing (7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide first and second alignment marks on both the submount and substrate surface of Mori et al to effectively and more easily obtain precise alignment of the laser diode in view of Nagano suggesting substrate surfaces in mounting optical heads may be designed to have an alignment mark or marks for accurately mounting the submount (4) (Col. 24, lines 18 – 20) and Takei et al teaching to provide first and second alignment marks on both components of an optical head that are to be aligned and joined, wherein one of ordinary skill in the art would readily recognize that employing alignment marks on both components would enable easier and more precise alignment.

As to the newly added claim limitation directed to the configuration of the alignment marks of the light source assembly not overlapping the alignment marks of the substrate, it is recognized that the secondary reference to Takei et al suggest

overlapping alignment marks. However, Takei as applied, provides a more general suggestion of alignment marks on both components being bonded in the light optics field. In having been motivated by Nagano to provide alignment marks to the substrate surface of Mori et al to provide for more accurate positioning of the laser submount, Takei et al is merely provided as evidence that such alignment is known to require aligning marks on both components being positioned with respect to one another. One of ordinary skill in the art would have readily appreciated overlapping aligning marks as specifically suggested by Takei et al would not have been feasible in the laser submount assemblies of Mori et al and Nagano, because the laser submount assemblies are not transparent. However, the more generic suggestion provided by Takei et al of providing alignment marks on both components would have readily motivated one of ordinary skill in the art to require alignment marks on both components, wherein the placement of the aligning marks, i.e. configured not to overlap, would have been within the purview of one of ordinary skill in the art so long as they still acted as alignment means to accurately position the laser submount on the substrate as motivated by Nagano.

As to adhesive bonding, Higashiura et al teach an optical pickup apparatus and disclose mounting a submount (3) carrying a laser diode (4) on to the surface of a substrate (2) and further teach fixing the submount (3) onto the surface (2a) via an adhesive (Col. 2, lines 47 – 58).

Ball et al teach an optical system including an optical head assembly having an optical beam generator and a lens assembly. Ball et al teach that the assembly and

alignment of the optical components is critical and further teach mounting the laser head assembly (12) onto the upper surface of a substrate (44) and securing thereto in a fixed manner by employing a compliant adhesive (46) (Col. 7, lines 1 – 47). Ball et al further suggest that employing this mounting technique isolates the optical components from the effects of thermal expansion, which minimizes the stresses that are deleterious to the optical alignment of the system.

It therefore would have been further obvious to one of ordinary skill in the art at the time of the invention to provide adhesive in mounting the submount of Mori et al in view of Higashiura teaching to employ adhesive to fixedly bond a submount onto a substrate surface in the manufacture of optical heads and further in view of Ball et al teaching that adhesively mounting a laser head assembly using a compliant adhesive will isolate each optical component from the effects of thermal expansion and therein protect against misalignment. As to mounting the integrated circuit device with adhesive, such would have been obvious to one of ordinary skill in the art at the time of the invention as the use of adhesive is considered a well known, conventional per se, means of bonding integrated circuit devices to printing circuit boards and only the expected mounting of Mori et al would be achieved.

As to claims 10, 11 and 20, one of ordinary skill in the art would have readily appreciated applying and activated the adhesive for the integrated circuit device after the submount is fixedly bonded so as most effectively align the integrated circuit device in relationship to the laser diode's fixed position as would readily be desired.

As to claims 17, 18, 24 and 25, it would have been obvious to one of ordinary skill in the art to employ a microscope to better view the alignment marks of the references as combined in mounting the submount as one of ordinary skill in the art would readily recognize that in accordance with the size of the components and alignment marks involved microscopic means would need to be employed to most effectively see the alignment marks and thereafter mount the submount in the precise location.

As to claim 26, Mori et al disclose mounting and electrically connecting the submount onto a lead frame (32). One of ordinary skill in the art would readily recognize said lead frame to comprise a bonding pad.

3. Claims 15 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mori et al (US 6,181,667) in view of Nagano (US 6,278,681), Takei et al (US 6,125,092), Higashiura (US 6,184,512) and Ball et al (US 6,370,290) as applied to claims 9 and 12 above, and further in view of DiStefano et al (US 5,518,964).

In the references as combined above, both of the secondary references to Higashiura and Ball et al appear to be silent as to activating the adhesive via a heat generator. However, Ball et al do suggest employing an adhesive from Ablestick and as disclosed by DiStefano et al, Ablebond™ is a bonding material produced by Ablestick used in mounting microelectronics that has an activation temperature above room temperature (Col. 17, lines 24 – 47). It therefore would have been obvious to one of ordinary skill in the art at the time of the invention to heat activate the adhesive of

Nagano in view of Higashiura and Ball et al as the adhesive suggested by Ball et al is known in the industry to be activated at a temperature above room temperature as disclosed by DiStefano et al.

4. Claims 27, 31, 32 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagano (US 6,278,681) in view of Takei et al (US 6,125,092).

Nagano teaches a method of fabricating an optical head including a laser diode chip. Referring to the embodiment of Figure 10, Nagano teaches mounting a submount (4) carrying a laser diode chip (1) onto the surface of a substrate (16). Nagano further teaches that the substrate surface may be designed to have an alignment mark or marks for accurately mounting the submount (4) (Col. 24, lines 18 – 20). Nagano appears to be silent as to providing alignment marks on the submount as well. Nagano also appears to be silent as to creating a fixed bond between the submount and substrate surface by employing an adhesive.

Takei et al teach an optical head assembly and further disclose aligning the optical components so as achieve a high precision optical path between the laser diode and objective lens. Takei et al suggest alignment marks for aligning grating component (12) onto unit case (7), which contains optical unit (70). Referring to Figure 2, Takei et al teach providing first and second alignment marks on the grating (12) and corresponding first and second alignment marks on the top surface of the casing (7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide first and second alignment marks on both the submount and

substrate surface of Nagano to more effectively and more easily obtain the alignment desired by Nagano in view of Takei et al teaching to provide first and second alignment marks on both components of an optical head that are to be aligned and joined, wherein one of ordinary skill in the art would readily recognize that employing alignment marks on both components would enable easier and more precise alignment.

As to the limitation directed to the configuration of the alignment marks of the light source assembly not overlapping the alignment marks of the substrate, it is recognized that the secondary reference to Takei et al suggest overlapping alignment marks. However, Takei as applied, provides a more general suggestion of alignments on both components being bonded in the light optics field. Nagano suggests providing alignment marks to the substrate surface to provide for more accurate positioning of the laser submount, Takei et al is provided as evidence that such alignment is known to require aligning marks on both components being positioned with respect to one another. One of ordinary skill in the art would have readily appreciated overlapping alignments as specifically suggested by Takei et al would not have been feasible in the laser submount assembly of Nagano, because the laser submount assembly is not transparent. However, the more generic suggestion provided by Takei et al of providing alignment marks on both components would have readily motivated one of ordinary skill in the art to require alignment marks on both components, wherein the placement of the alignment marks, i.e. configured not to overlap, would have been within the purview of one of ordinary skill in the art so long as they still acted as alignment means to accurately position the laser submount on the substrate as taught by Nagano.

As to claims 32 and 33 and the use of a microscope, it would have been obvious to one of ordinary skill in the art to employ a microscope to better view the alignment marks of Nagano in mounting the submount onto the photodiode chip as one of ordinary skill in the art would readily recognize that in accordance with the size of the components and alignment marks involved, microscopic means would need to be employed to most effectively see the alignment marks and thereafter mount the submount in the precise location.

As to claim 34, in the embodiment of Figure 31b, Nagano discloses mounting the submount onto an electrode (48b). One of ordinary skill in the art would readily recognize said electrode to be an electrode bonding pad.

5. Claims 28, 29 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagano (US 6,278,681) in view of Takei et al (US 6,125,092) as applied to claim 27 above, and further in view of Higashiura et al (US 6,184,512) and Ball et al (US 6,370,290).

The references as combined with respect to claim 27, appear to be silent as to creating a fixed bond between the submount and substrate surface by employing an adhesive.

Higashiura et al teach an optical pickup apparatus and disclose mounting a submount (3) carrying a laser diode (4) on to the surface of a substrate (2) and further teach fixing the submount (3) onto the surface (2a) via an adhesive (Col. 2, lines 47 – 58).

Ball et al teach an optical system including an optical head assembly having an optical beam generator and a lens assembly. Ball et al teach that the assembly and alignment of the optical components is critical and further teach mounting the laser head assembly (12) onto the upper surface of a substrate (44) and securing thereto in a fixed manner by employing a compliant adhesive (46) (Col. 8, lines 1 – 47). Ball et al further suggest that employing this mounting technique isolates the optical components from the effects of thermal expansion, which minimizes the stresses that are deleterious to the optical alignment of the system.

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide an adhesive in mounting the submount of Nagano in view of Higashiura teaching to employ adhesive to fixedly bond a submount onto a substrate surface in the manufacture of optical heads and further in view of Ball et al teaching that adhesively mounting a laser head assembly using a compliant adhesive will isolate each optical component from the effects of thermal expansion and therein protect against misalignment.

As to claim 34, in the embodiment of Figure 31b, Nagano discloses mounting the submount onto an electrode (48b). One of ordinary skill in the art would readily recognize said electrode to be an electrode bonding pad.

6. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagano (US 6,278,681) in view of Takei et al (US 6,125,092), Higashiura et al (US 6,184,512)

and Ball et al (US 6,370,290) as applied to claims 27 and 28 above, and further in view of DiStefano et al (US 5,518,964).

In the references as combined above, both of the secondary references to Higashiura and Ball et al appear to be silent as to activating the adhesive via a heat generator. However, Ball et al do suggest employing an adhesive from Ablestick and as disclosed by DiStefano et al, Ablebond™ is a bonding material produced by Ablestick used in mounting microelectronics that has an activation temperature above room temperature (Col. 17, lines 24 – 47). It therefore would have been obvious to one of ordinary skill in the art at the time of the invention to heat activate the adhesive of Nagano in view of Higashiura and Ball et al as the adhesive suggested by Ball et al is known in the industry to be activated at a temperature above room temperature as disclosed by DiStefano et al.

Response to Arguments

7. Applicant's arguments filed 11-24-03 have been fully considered but they are not persuasive.

Applicant's arguments with respect to claims 9 and 12 and the newly added claim limitations directed to the configuration of the alignment marks not overlapping are not persuasive. As now provided in the rejection above, having been motivated by Nagano to provide alignment marks on the laser submount for accurate mounting, the configuration of the alignment marks appears to offer no unexpected results and as such, would be within the purview of one of ordinary skill in the art so long as the end

result was achieved. Takei et al in providing evidence of alignment marks on both components would not have limited the configuration of such alignment marks one of ordinary skill in the art would have been motivated to employ in mounting the laser submount of Mori et al. Non-overlapping alignment marks would have been within the purview of one of ordinary skill and only the expected alignment ability would be achieved.

In regard to applicant's argument with respect to Mori et al not providing concern with the alignment of the laser device to the substrate, such concern and motivation for concern are provided by the secondary reference to Nagano, wherein Nagano positively suggests alignment marks for accurate mounting.

Applicant's argument with respect to Takei et al being directed to alignment of transparent components, wherein the laser submount assemblies of Mori et al and Nagano are not transparent and therefore such a combination of references is misplaced is not persuasive. Takei et al is merely provided as evidence that it is known in aligning to provide alignment marks on both components being positioned with respect to one another. One of ordinary skill in the art would have found this general suggestion pertinent in carrying out the alignment suggested by Nagano et al and therefore such a reference is considered analogous art.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Todd J. Kilkenny whose telephone number is (703) 305-6386, or if attempting to contact after December 18, 2003 (571) 272-1219. The examiner can normally be reached on Mon - Fri (9 - 5).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeff Aftergut can be reached on (571) 272-1212. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

TJK


JEFF H. AFTERGUT
PRIMARY EXAMINER
GROUP 1300